

## ABSTRACT

Methods and apparatus for determining leak and respiratory airflow are disclosed. A pressure sensor (34) and a differential pressure sensor (32) have  
5 connection with a pneumotach (24) to derive instantaneous mask pressure and airflow respectively. A microcontroller (38) estimates a non-linear conductance of any leak path occurring at a mask (12) as being the low pass filtered instantaneous airflow divided by the low pass filtered square root of the instantaneous pressure. The  
10 instantaneous leak flow is then the conductance multiplied by the square root of the instantaneous pressure, and the respiratory airflow is calculated as being the instantaneous airflow minus the instantaneous leak flow. The time constants for the low pass filtering performed by the microcontroller (38) can be dynamically adjusted dependent upon sudden changes in the instantaneous leak flow.